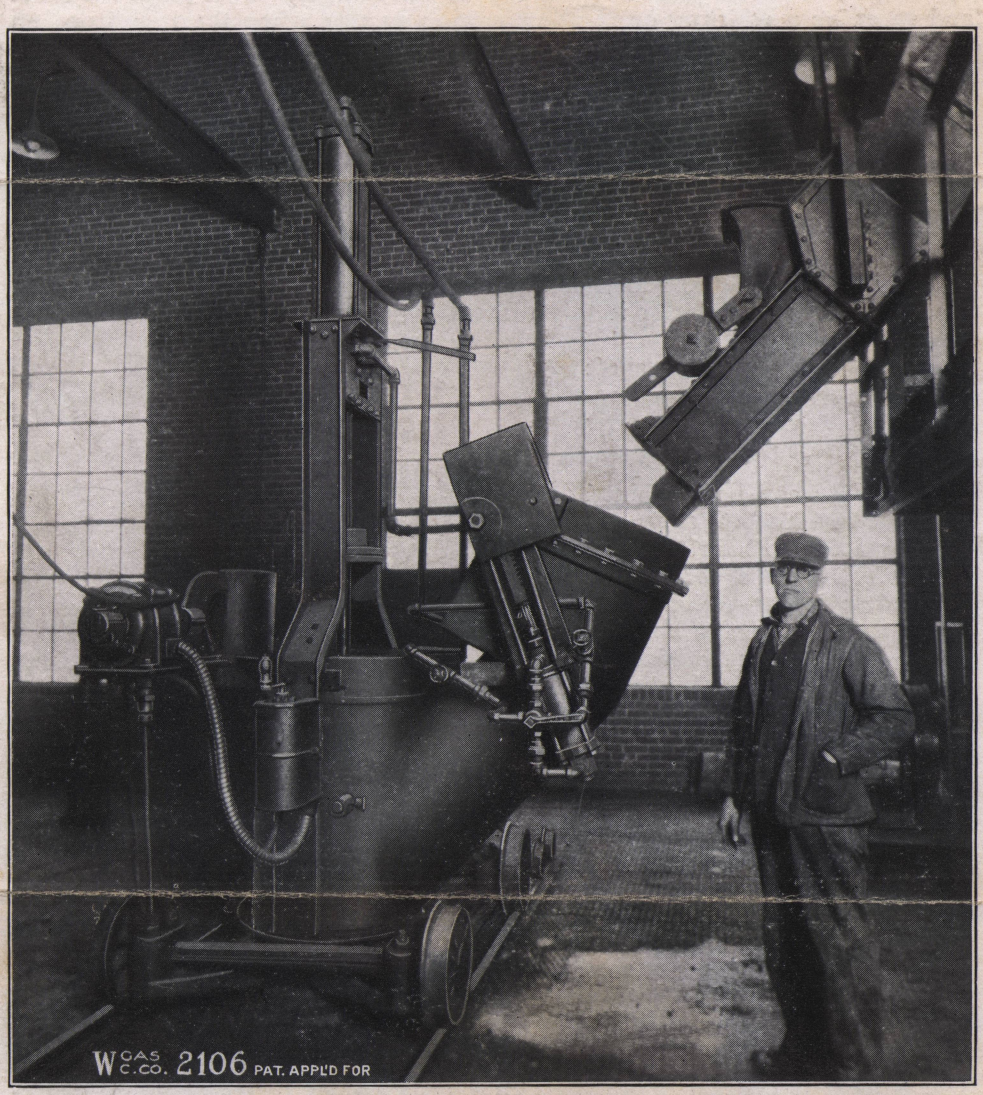
HOWARD AUTOMATIC CHARGERS

For Water Gas Sets



BULLETIN NO. W—26.

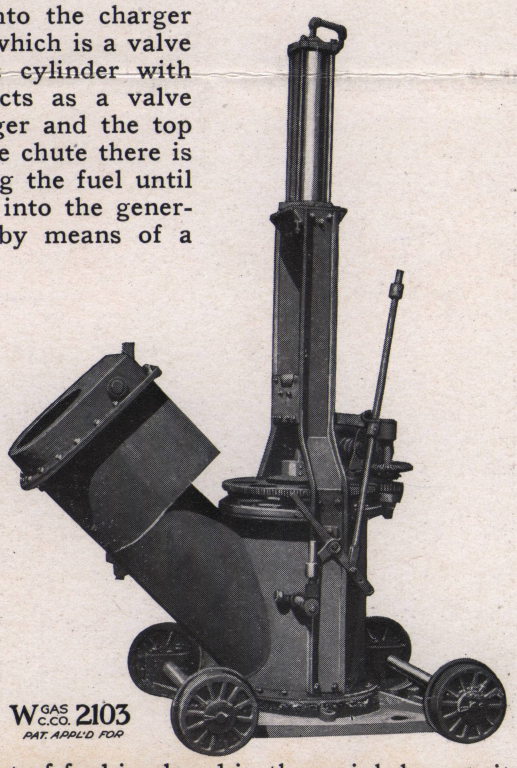
This automatic charger **CAN BE APPLIED TO ANY WATER GAS MACHINE** now in operation **WITHOUT ANY ALTERATIONS** to the generator.

The Western Gas Construction Co.

FORT WAYNE, INDIANA

The Howard Automatic Charger is of cylindrical design and fits over the charging door frame on the top of the generator. In the center of this cylinder is a shaft which has a vertical motion actuated from a hydraulic cylinder placed on top of the charger. A cast iron spreader is attached to the bottom of this shaft and goes down into the dome of the generator when the shaft is in its lower position. When the shaft with spreader attached reaches the lower position it engages with a friction clutch operated by means of a motor placed on the side of the charger. This gives the shaft and spreader a whirling or rotating motion so that when the fuel drops on to this spreader, both the fine and the coarse pieces are thrown against the side walls of the generator.

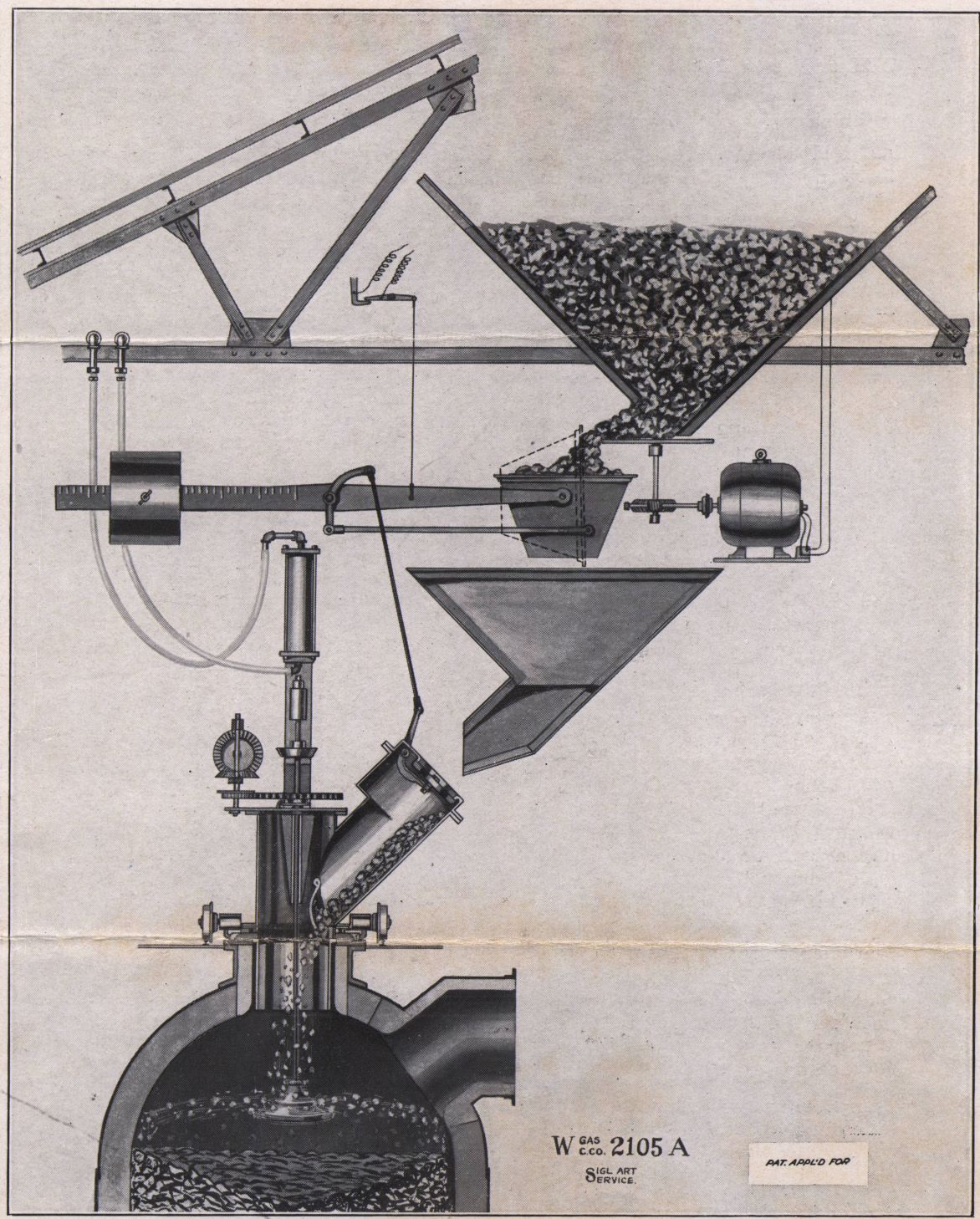
The generator fuel is introduced into the charger by means of a chute in the top of which is a valve operated by means of a hydraulic cylinder with rack and pinion. The spreader acts as a valve while the fuel is entering the charger and the top valve is open. At the bottom of the chute there is a set of retaining prongs for holding the fuel until the proper time comes for it to go into the generator. These prongs are actuated by means of a lever motion from the shaft carrying the spreader and release the fuel after the spreader is in its lowest position.



The charger can be combined with the automatic fuel weighing machine illustrated on page No. 3. This consists of a rotating feeder which feeds coal from an overhead bin into a weigh hopper suspended on one end of a balance beam. The other end of the beam is graduated for setting the weight. Directly below this hopper is a funnel hopper thru which the fuel passes into the chute on the side of the charger. As soon as the predetermined amount of fuel is placed in the weigh hopper it overbalances the weight and opens the switch which supplies the current to the motor. The inlet valve on the charger is opened by the hydraulic cylinder controlled from the automatic control which also trips the bucket, discharging the fuel into the funnel hopper from where it runs into the charger. When the inlet valve is shut the bucket is returned to its original position and again filled with a weighed amount of fuel ready for the next cycle.

The automatic charger is mounted on wheels similar to the standard charging door and runs on the same track so that it can be moved to one side and replaced by the ordinary charging door without interruption to the operation of the water gas machine.

Variation in speed of the charging bell permits of various degrees for concave coning the fire. Alternating non-whirling charges with high and low speed whirling charges may be combined to keep practically a level fire.



HOWARD AUTOMATIC CHARGERS COMBINED WITH AUTOMATIC FUEL WEIGHING MACHINE.

Howard Automatic Chargers can be ATTACHED TO ANY WATER GAS SET and actual operating results with their use have shown an INCREASE IN CAPACITY of about fifteen per cent. Among the factors which accomplish such improved results are:—

A UNIFORMLY HIGH ACTIVE FIRE is accomplished by the distributor throwing in a small amount of fuel during each down run. This continually adds new layers of fresh fuel and keeps the fuel bed up to the maximum depth.

ELIMINATION OF CHARGING TIME — From three to four minutes per hour shut down time for charging are eliminated because there is no interruption whatever to the gas making or blowing time. The machine is continually on blow or run for nine or ten hours between actual clinkering periods.

FUEL DISTRIBUTION — The charger bell revolves throwing the fine fuel and the coarse fuel against the side walls. The coarse fuel tends to roll into the hollow center and this leaves an effective porous center with the finer material backed against the side walls and tends toward uniform conditions over the entire cross section of the machine, keeping the entire area of the machine active.

LOW CENTER FIRE — This is a matter of actual observation and is merely optical proof of the successful method of operation described above.

RELATIVELY COOL FIRE TOP — The addition of fresh charge each run keeps a cool top surface above the fuel bed which tends to efficiency in blasting without at all decreasing the gas making capacity as the fire is uniformly deeper than the average fuel depth of standard practice.

SMALL AND FREQUENT CHARGES — By the use of the automatic charger, small and frequent charges of fuel are put into the generator thereby providing the necessary operating conditions for successfully using bituminous coal as generator fuel. Small charges at short intervals fill the blow holes in the forming. SMOKE IS ELIMINATED.

REDUCTION IN SIDE WALL CLINKER — Finely divided fuel along the wall of the generator reduces the excessive rate of combustion around the periphery and keeps the ash accumulation distributed over the entire grate area and avoids the concentration of clinker around the side.